Working Paper Series: WP No. 2003

Lending Rate Behavior in Bangladesh: Some Facts and Determinants

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August 2020

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Abstract

The intention of this study is to identify the determinants of the lending rate in Bangladesh. Empirical estimation by Ordinary Least Square (OLS) method using quarterly data from 2010 to 2018 show that bank deposit rates i.e., cost of fund is one of the main determining factors that affect the lending rate of all banks in Bangladesh. Empirical Analysis derived from OLS showed that both 3-year and 5-year national savings directorate (NSD) rates do not have any impact on the lending rate for all groups of banks except for the State Owned Commercial Banks (SCBs). The SCBs and Foreign Commercial Banks (FCBs) adjust lending rates with inflation while Specialized Banks (SPBs) and Private Commercial Banks (PCBs) do not adjust inflation with the lending rate. Non-performing loans matter for only SCBs although appears with the wrong sign. FCBs and SCBs consider repo and reverse repo policy rates while determine the lending rates. Besides, an empirical investigation and also data analysis suggest that the highest level of the lending rates that do not affect the private sector credit lies within the range of 9.91-10.0 percent above which the private sector credit growth may be affected adversely in Bangladesh.

Keywords: Interest Rate, Money and Credit, and Non-Performing Loans (NPLs).

JEL Classifications: E43, E51, E58.

I. Introduction and Background

The nominal lending rate in Bangladesh is claimed to be much higher and do not conducive to doing business as higher lending rate inhibits private sector credits and investment demand and hence hurt economic growth. Moreover, it has also been argued that the prevailing lending rate does not determine based on risks and other macroeconomic factors such as inflation. Therefore, the intention of this study is to identify the causative factors for persistent higher interest rate

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particularly lending rates in Bangladesh. In doing so, the relationship between the lending rates and the macroeconomic and banks specific factors have been analyzed thoroughly.

There are many factors that affect the lending rates in Bangladesh. A model is specified using some macroeconomic and bank specific variables that are assumed to have some impact on the lending rates. In theory, the lending rate of any banks depends on many factors such as, cost of fund such as- deposit rate, operating cost, non-performing loans, unremunerated assets and more specifically other competitive rates such as NSD certificate rate. Therefore, the plan of the study is as follows: after introduction in section-I related literature have been discussed in section-II; in section section-III a brief description of the interest rate policy in Bangladesh is deliberated. Section IV analyzes the lending rate behavior and its relationship with other macroeconomic variables. Empirical results estimating from determinants of the lending interest rate and optimal level of lending rate that hurts private sector credit have been analyzed in section V. Finally, conclusions and recommendations are given in section VI.

II. Literature Review

Analyses of banks spread have been discussed extensively in the literature of banking and finance due to its importance in policy making in developed and developing countries. Despite much talk on that related empirical study that determines the causes of persistent high lending rate is a few in Bangladesh. Roe and Peachy (2005) conducted a study on the interest rate behavior of Bangladesh. This report provides preliminary indication of the key factors causing high interest rate spread and underlying issues with it. The report focused on institutional policy, structural, economic and other factors affecting interest rate spread in Bangladesh. As per this report interest rate spread has some common, macroeconomic and institutional causes. The macroeconomic causes are inflation rate, monetary policy, terms of trade. Bank specific factors such as non-performing loans; compliance-provisioning and capital adequacy; deposits rate; operating cost; liquidity risk; cash reserve ratio (CRR), statutory liquidity ratio (SLR); idle money with Bangladesh Bank (BB); imperfect competition; high corporate tax rate; absence of risk management practices affects the spread in Bangladesh; besides, a perception of high risk in the economy as a whole, national savings certificates rate; if commission and services charges is not enough for cost also affect spread. However, the report finds that the causes are not fixed and it varies within the bank group.

Mujeri and Younus (2009) uses a bank profit maximization model based on an empirical industrial organization approach to explain the interest rate spread (IRS) in the banking sector of Bangladesh using panel data of 48 banks covering the period from 2004 to 2008. The analysis shows that the higher the non-interest income as a ratio of total assets of a bank, the lower its spread. Similarly, market share of deposits of a bank, statutory reserve requirements, and NSD certificate interest rates affect the IRS. The analysis in terms of bank groups shows that IRS is significantly influenced by operating costs and classified loans for state owned commercial banks (SCBs) and specialized banks (SBs), while inflation, operating costs, market share of deposits, statutory reserve requirements, and taxes are the important factors for the private commercial banks (PCBs). Non-interest income, inflation, market share and taxes matter for the foreign commercial banks spread (FCBs).

On the other hand, Rubina (2013) attempted to reveal the correlation between the deposit rate and the lending rate with the interest rate spread (IRS) in Bangladesh for the sample period from 1974 to 2011. Descriptive statistics are used to explain the trends of weighted average lending rate and deposit rate of the commercial banks. Correlation analysis is used to identify the linear relationship among the variables. The result shows that there is no bilateral directional relationship between IRS and either with the deposit rate or the lending late. Her study also did not find any relationship with the deposit rate and the lending rate.

Tigran et al. (2012) analyzed the factors that drive financial intermediation costs in low-income countries (LICs) relative to emerging countries (EMs). Bank Scope database have been used for the 359 commercial banks in 48 Low Income Counties (LICs) and 2535 commercial banks in 67 Emerging Markets (EMs) economy for the period from 1996 to 2010. Net interest margin, bank specific determinants such as market concentration, operating cost, risk aversion, credit risk, liquidity, size of operation, macroeconomic determinants such as economic activity, inflation, institutional determinants, rule of law, control of corruption, etc are the key variables that affects the spread of EMs. The empirical results show that within the LICs a substantial part of the variation in interest margins can be explained by bank-specific factors like margins which tend to increase with higher riskiness of credit portfolio, lower bank capitalization, and smaller bank size. Overall, their study finds that concentrated market structures and lack of competition in

LICs banking systems and institutional weaknesses are the key impediments which prevent financial intermediation costs from declining. The econometric analysis provides evidences that there exist differences between LICs and EMs banks. Compared to EMs, margins in LICs banks appear to be more responsive to the market structure, suggesting that promoting banking competition can be an important tool to reduce interest margins in LICs.

Ayesha (2011) attempts to examine the market discipline in the post financial system reform period in Pakistan using panel data of various bank specific and macroeconomic variables for the period of 2004 to 2009. The determinants of interest rate spreads (operational efficiency, asset quality, liquidity, risk absorption capacity and GDP growth) and margins in Pakistan's commercial banking sector in the post transition period are analyzed. The findings demonstrate strong evidence of bank size in explaining the interest rate spread in Pakistan.

Thorsten and Heiko (2009) explored the factors behind consistently high interest rate spread and margins using international comparisons and a unique bank-level dataset on the Ugandan banking system over the period 1999 to 2005. International comparisons show that large proportions of the high Ugandan interest rate margins can be explained by the small size of Ugandan banks, persistently high T-Bill rates and institutional deficiencies. The Ugandan bank panel recognizes the importance of macroeconomic factors, such as high inflation, high T-Bill rates and exchange rate appreciation for the higher spread in Uganda.

Bhattacharya et al. (2008) examined the behavior of various Indian interest rates, such as call money rate, and yields on secondary market securities with maturity periods of 15 to 91 days, 1-year, 5-years and 10-years, using the monthly data covering the period from 1996 to 2005. The determinants of interest rates have been investigated by using a bounds testing autoregressive distributed lag (ARDL) approach to co-integration for testing long-run relationships and it has been found that macroeconomic variables such as yield spread and expected exchange rate are mainly affected by the movements of international interest rates, although with some lags but the policy variables such as bank rate and federal funds rate did not show any significant impact on any of the interest rates. More elaborately, the results show that the expected exchange rate and foreign interest rates do play a significant role in the determination of interest rates in India.

While the expected exchange rate exercises an adverse impact, the foreign interest rates have a positive impact on the domestic rates. However, the growth rate of bank credit and broad money supply do not play any role in influencing the interest rates in India.

Khawaja et al. (2007) attempted to examine the determinants of interest rate spread in Pakistan using panel data for the period from 1998 to 2005 of 29 banks. By using the fixed-effects model they found that inelasticity of deposit supply is a major determinant of interest spread whereas industry concentration has no significant influence on interest spread. They identified the absence of alternate options for the savers as one of the reasons of inelasticity of deposits supply to the banks. The on-going merger wave in the banking industry will further limit the options for the savers. Given the adverse implications of banking mergers for a competitive environment, they argued that to maintain a reasonably competitive environment, merger proposals may be subjected to review by an antitrust authority with the central bank retaining the veto over merger approval.

Nguyen et al. (2010) tried to reveal whether asymmetric adjustments in the Bangladeshi lending-deposit rate spread exist and if exist then how does Bangladesh economy responds to such asymmetries and finally if the results have different interpretation as the model is developed from data of Bangladesh economy. Nguyen et al. reviewed numerous literatures and found three main theoretical explanations for commercial bank interest rate asymmetries which are the bank concentration hypothesis (Neumark and Sharpe, 1992, Hannan and Berger, 1991), the consumer characteristic hypothesis (Calem and Mester 1995, Hutchison 1995, Rosen 1995) and adverse selection problem in lending markets because of asymmetric information (Stiglitz and Weiss 1981). Based on these theories Nguyen et al. collected monthly data on lending rate and deposit rate from the International Financial Statistics over the period 1997:2 to 2010:2 and estimated the threshold autoregressive (TAR) model developed by Enders and Siklos (2001). They also applied VEC to further investigate the short run and long run dynamics. These empirical results imply that the Bangladeshi lending rate and deposit rate adjustments affected each other's movements and evidence of Granger bidirectional causality is prominent. The results further revealed that when a shock narrows the lending rate adjust to the long-run equilibrium faster than when it widens the basis.

III. **Brief description of the interest rate policy in Bangladesh**

Bangladesh is practicing monetary targeting since her independence in 1971 under different exchange rate regimes. Prior to 1990, the policy was based on direct control of various instruments, such as volume and direction of credit and interest rates. Since the adoption of Financial Sector Reform Program in 1990, the policy stance has shifted toward indirect control. Until 1990, the deposit and lending rates were administered interest rates. During that period, interest rates were revised rarely to adjust to inflation. However, in order to introduce market based interest rate system, a new interest rate policy was put in place in early 1990. Under this policy, banks were allowed to determine their interest rates for both deposit and lending.

Initially Bangladesh Bank used to prescribe the interest rate bands for different categories of lending and the banks were allowed to move freely within the bands. Gradually the interest rate bands for lending were widened and ultimately withdrawn in April 1992, except for three priority sectors (agriculture, export and small and cottage industries). Interest rate bands for lending to agriculture and small and cottage industries were lifted in August 1999. Still there is interest rate ceiling for export loans. Floors on deposits, were in force until February 1996, thereafter they were withdrawn.

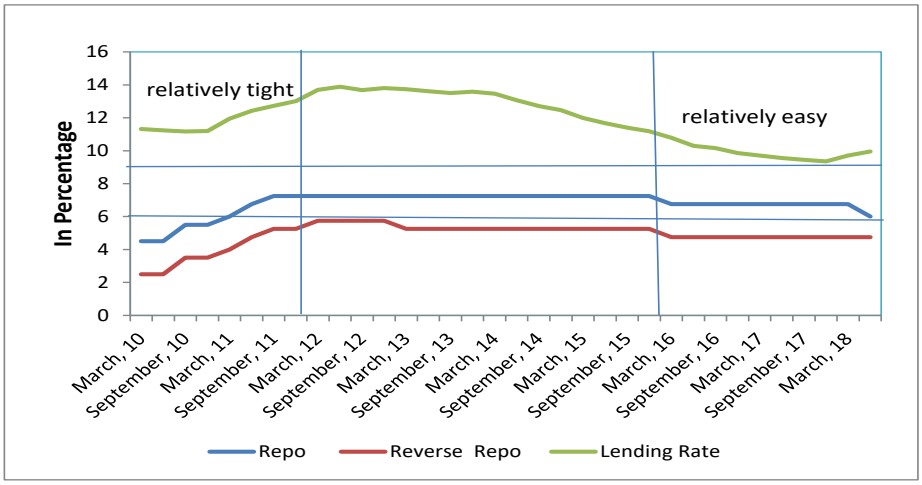
To make the businesses more competitive, the central bank set lending cap on some sectors following the global economic meltdown in 2008. The cap was put into force in April 2009. On March 9, 2011, BB withdrew the cap of 13 percent interest on lending except for agricultural and industrial sub sectors loans such as term lending for energy or power infrastructures. Open market operation as policy instrument was not much effective until 1990. In 1990, Bangladesh Bank introduced its own security called “90 - Day Bangladesh Bank Bill” and later “30-Day Bangladesh Bank Bill” was also introduced in 1995. The process of auction through market based interest rates was also extended to government treasury bills from early 1990s.

Repurchase agreement (repo) and reverse repo were introduced for banks and financial institutions as indirect monetary policy tools for day - to - day liquidity management in response

to temporary and unexpected disturbances in the supply and demand for money. Repo auction enables banks to place bids for funds collateralized by treasury bills. The Bangladesh Bank accepts the bids to the extent needed to maintain the intended level of market liquidity. Reverse Repo auction is the counterpart of repo auction, in which the banks submit offers of their excess funds, which the Bangladesh Bank accepts to the extent needed to maintain the intended level of liquidity. The inflow of liquidity with repo operations helps in easing seasonal volatility in the call money rate and stabilizes the money market. To encourage and facilitate inter- bank repo operations with same day recording of the transfers of securities, steps, such as the introduction of primary dealership system, were taken to activate the secondary market for government treasury bills or bonds. To establish a high-tech standard transaction mechanism for various government bills or bonds in primary and secondary markets, an online system has been put in place since October 20, 2003.

IV. Lending rate behavior and its relationship with other macroeconomic variables

Chart-1: Monetary Policy Stance and Lending Rate

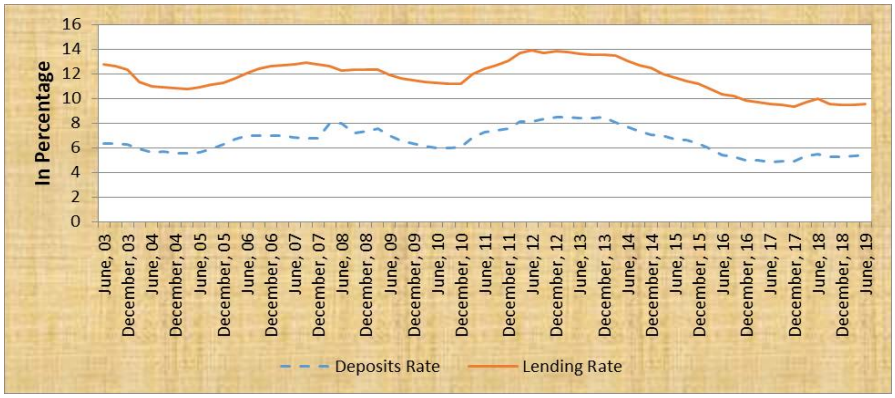


Source: Bangladesh Bank Quarterly

From Chart-1 it is evident that since 2010, the central bank changes its policy stances seven times. The Chart-1 also shows that every times policy rate changes the lending rate followed the trend with some lags.

Monetary Policy Stance		
		Repo Rate
Phase-1	March,10-June,10	4.50
Phase-2	September, 10-December,10	5.50
Phase-3	March, 11	6.00
Phase-4	June, 11	6.75
Phase-5	September, 11-December,15	7.25
Phase-6	March, 16-March, 18	6.75
Phase-7	June, 18	6.00

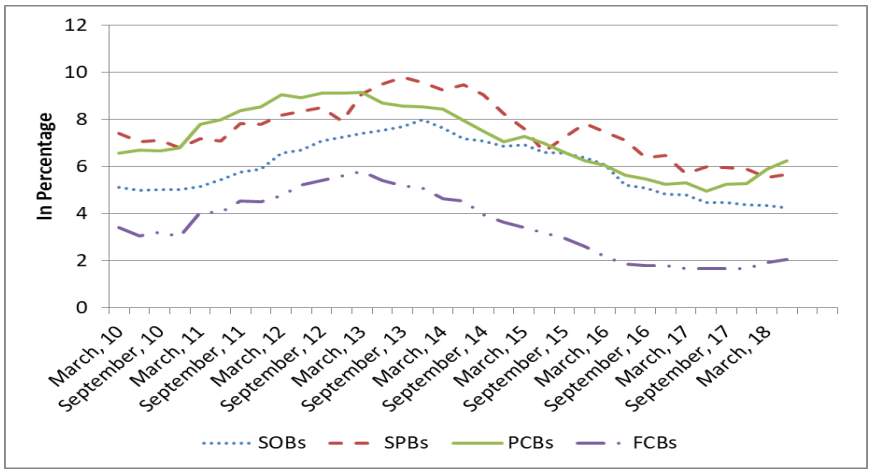
Chart-2: Trends of Deposits and Lending rate: Sample period: June, 2003-June, 2019



Source: Bangladesh Bank Quarterly

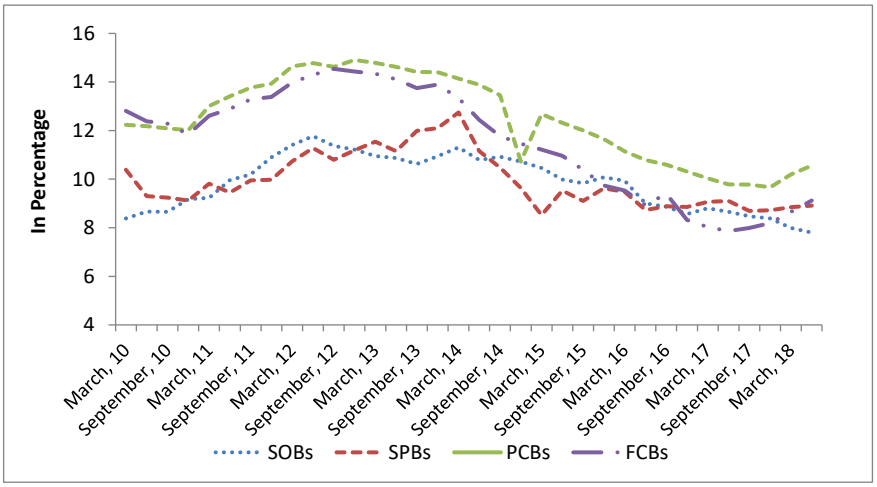
The above Chart-2 shows the trend of the weighted average lending and deposits rate since June, 2003 to June, 2019. It is observed from the above Chart-2 that both the deposit and lending rates moved together and have similar co-movements. Both the rates started to decline since December 2003 which continued until mid-2005 before starting to increase in 2006 and continued to mid-2008. From 2014 both the rates shows downward trend. The spread between lending and deposits rate was wider during the decades of 2000's than 2010's.

Chart-3: Deposit rate behavior of group of banks



Source: Bangladesh Bank Quarterly

Chart-4: Lending rate of group of banks



Source: Bangladesh Bank Quarterly

The above Charts 3 and 4 show the trends of deposit and the lending rate of group of banks. Chart-3 on quarterly data reveal that the deposit rates of PCBs and SPBs were much higher and have similar trends since 2010 compared with the other counterparts. The FCBs has the lowest deposit rate among the groups. It is observed from Chart-4 that the lending rates of PCBs and FCBs were much higher and moved at the same level throughout the period under review Compared with SOBs and SPBs lending rates were much lower.

Chart-5: Distribution of Individual Bank Weighted Average Deposit Rate (WADR)

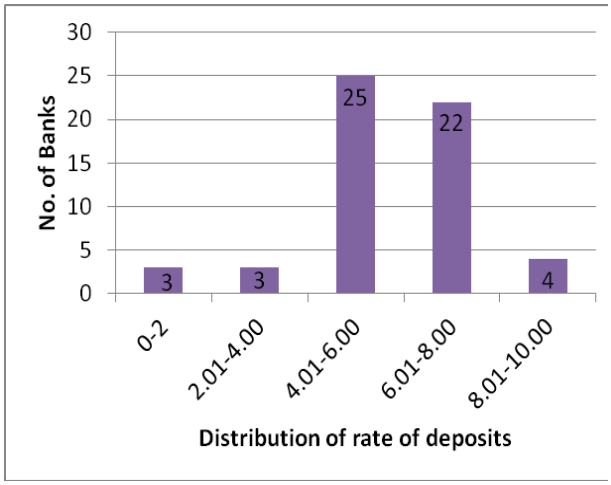
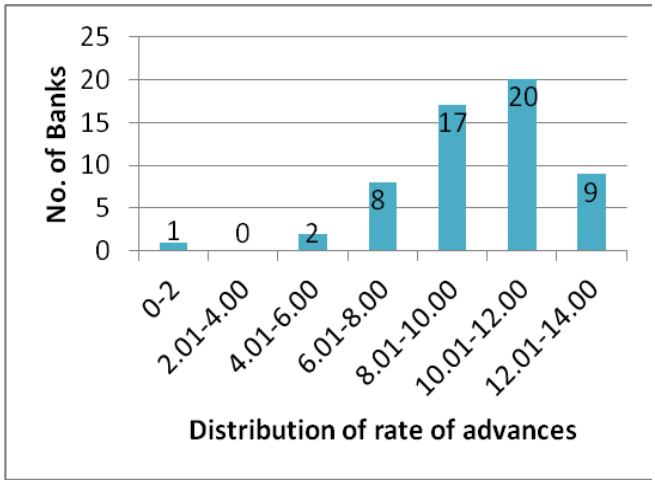


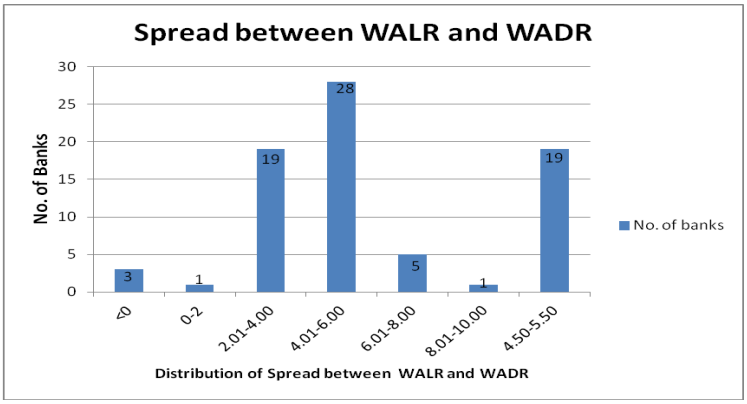
Chart-6: Distribution of Individual Bank Weighted Average Lending Rate (WALR)



Source: Statistics Department, Bangladesh Bank.

Chart 5 and 6 show the frequency distribution of deposit and lending rate in December, 2018. Chart-5 shows that out of 57 banks 25 banks have the deposits rates from 4-6 percent while 22 banks deposit rate is in the range of 6-8 percent, 4 banks have the deposits rates from 8-10 percent, 3 banks have 2-4 percent and remaining 3 banks have 0-2 percent. On the other hand, Chart-6 shows that out of 57 banks 20 banks have the advance rate from 10-12 percent while 17 banks fall in the range of 8-10 percent, 9 banks have advance rate from 12-14 percent, 8 banks have 6-8 percent, 2 banks have 4-6 percent and remaining 1 bank has 0-2 percent.

Chart-7: Distribution of individual bank spread of weighted average lending and deposit rate: December, 2018.

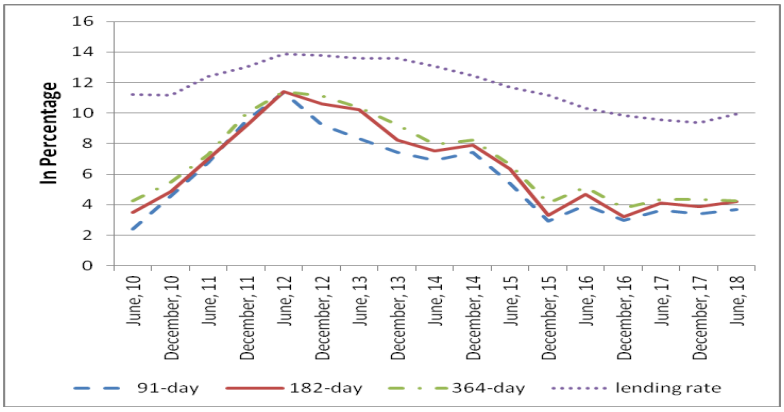


Source: Source: Statistics Department, Bangladesh Bank.

From Chart-7, it is been shown that out of 57 banks 28 banks have the spread between 4-6 percent, while 19 banks have 4.5-5.5 percent, 19 banks have spread of 2-4 percent, 5 banks have 6-8 percent and 3 have negative spread.

Relationship between lending rate and other rates and variables

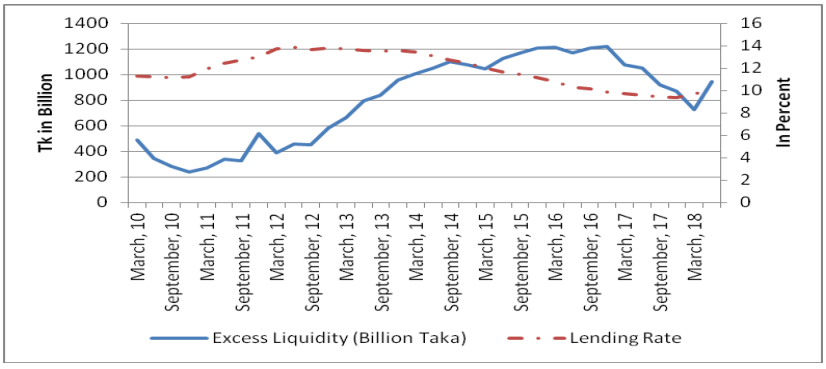
Chart-8: Trends in lending rate and other T-bill rate



Source: Bangladesh Bank Quarterly.

Chart-8 shows the trends of 91-day, 182-day and 364-day T. bill rates with the lending rate. All T. bill rates show close movements with each other. The movement of lending rate with T. bill rates is also similar with different degrees. From Chart-9, the relationship between the lending rate and the excess liquidity is also indicates some sort of relationship as the lower excess liquidity drives up the lending rate while opposites happen when the excess liquidity was higher.

Chart-9: Excess liquidity and the lending rate



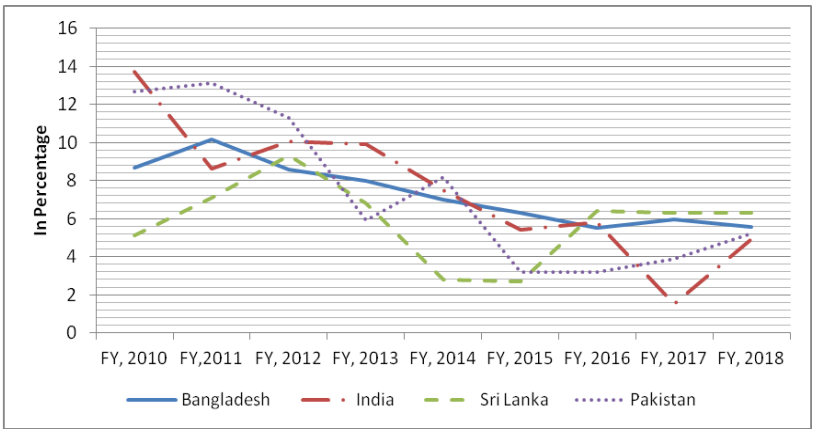
Source: Monetary Policy Department, Bangladesh Bank

World Lending and Deposits Rate

Trend in lending, deposits and inflation of some selected countries

In view of visualizing recent trends in interest and inflation rates in some selected countries, several charts containing inflation from 2010 to 2018, real interest rate and deposit and lending rate during the period from 2010 to 2017 has been used.

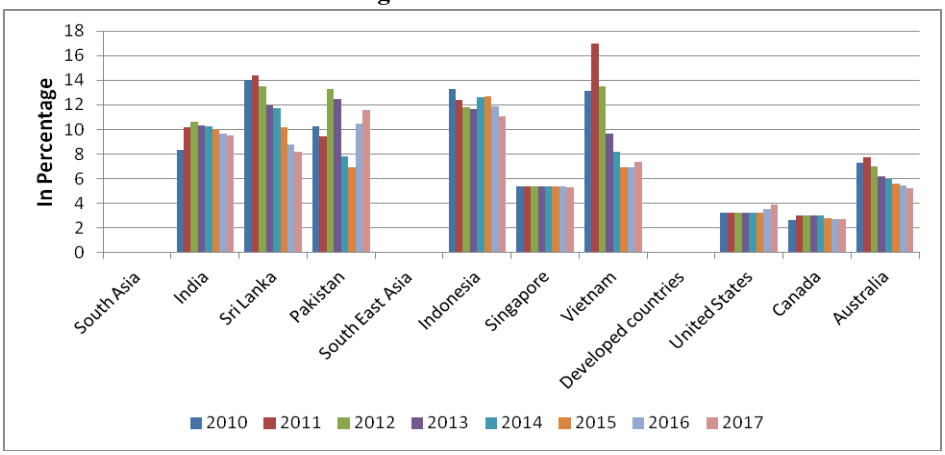
Chart-10: Trends in inflation rate of some South Asian countries



Source: Bangladesh Bank Quarterly.

Chart-10 shows the recent trends in inflation rate (consumer prices annual %)) of some South Asian Countries from 2010 to 2018. In 2010 inflation rate was very high of all South Asian countries particularly in India due to increase in food prices during that period. In 2010, while international food price became relatively stable there were downward pressures on inflation. However, in 2018, each of the four countries inflation rate has been reduced to single digit. Bangladesh and Sri Lanka are showing almost same trend over this period except for India and Pakistan.

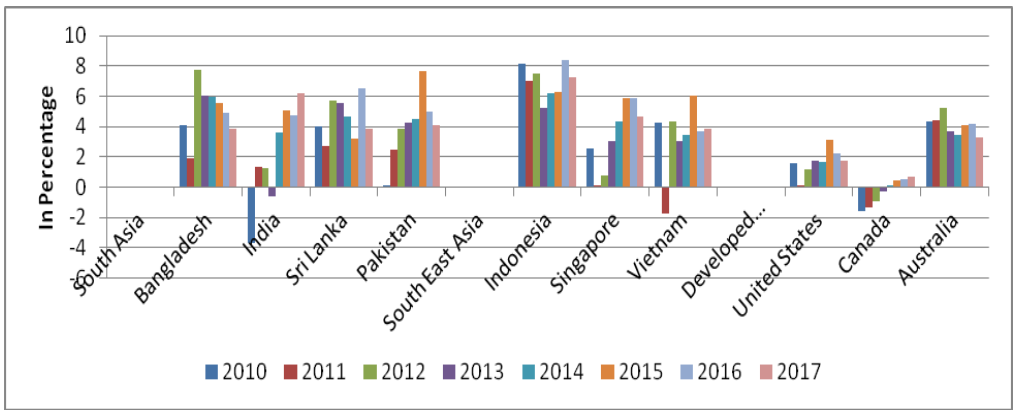
Chart-11: Lending Rate of Some Selected Countries



Source: World Development Indicators

The above Chart-11 shows that the lending rate is very high in South Asian and some of the South East Asian countries comparative to developed countries. The lending of Sri Lanka has decreased significantly, whereas it shows ups and down trend in Pakistan and relatively stable in India during the last five years. Though Singapore is maintaining a stable lower lending rate and this rate is very low compared with the other South East Asian countries. The representing developed countries have relatively more stable and lower interest rate not exceeding single digit.

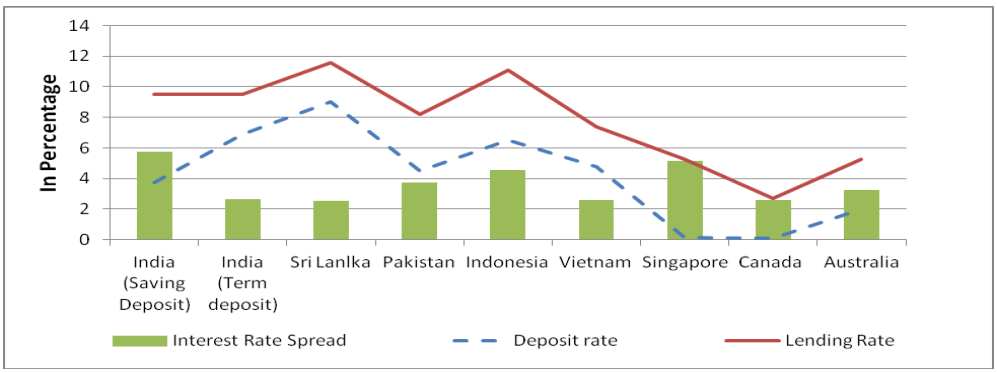
Chart-12: Real Lending Rate of Some Selected Countries



Source: World Development Indicators

Real lending rate is adjusted for inflation measured by the GDP deflator. From Chart-12, it can be said that the real interest rate is comparatively high in Bangladesh than other South Asian countries, but it has a decreasing trend from 2013. The real interest rate is very volatile in most of the countries and some countries have even negative real interest rate in some periods due to volatility in inflation.

Chart-13: Interest rate spread of different countries in 2017



Source: World Development Indicators

From above Chart-13, it is observed that most of the South Asian and South East Asian countries' have greater interest rate spread whereas developing countries like Canada or Australia have relatively lower interest rate spread.

An attempt has been made to identify the determinants of the lending rate behavior in Bangladesh. The following model variables have been used to estimate the model.

V: Model Variables, Model Specification and Empirical Results

In order to estimate the determinants of lending rate of all scheduled banks and bank group wise Ordinary Least Square (OLS) method is used for the sample period from 2010:q1 to 2018:q2. The model variables are used are as follows:

lr= weighted average lending rate of all banks and also bank group-wise;

dr= weighted average deposits rate of all banks and bank group-wise;

inf= CPI Inflation rate (12 month average)

npl= Non-performing loans of all banks and also bank group.

psc= private sector credit

nsd= national saving directorate of 3 and 5 years

Repo and Reverse Repo= policy rates of central bank.

Model Specification

lr= $\int(dr, inf, npl, psc, nsd, polic\ rate)$

lr= $\alpha_{0it}+\alpha_{1i}$dr+ α_{2i}inf+α_{3i}npl+ α_{4i}policy rate+α_{5i}nsd+α_{6i}psc+ε_t

$expected\ parameters, \alpha 0i \ldots . \alpha 6i > 0$

Data Analysis

All the variables used in the model are stationary as suggested by augmented –Dickey Fuller (ADF) and Phillips Perron (PP) methods in levels. Private sector credit are used in the growth form while rate of inflation, non-performing loans, lending and deposits rate, repo and reverse repo have been used in its level form.

Empirical results: All Banks

The deposit rate and the inflation for all banks are significant at 1% and 5% level respectively and appear with the expected positive signs. This implies that one percentage point increase in the deposits rate will increase the lending rate by 1.07 percentage points. Both 3 and 5 year NSD certificate rates are not significant for all banks and so are repo and reverse repo policy rates and non-performing loans.

Dependent Variable: Lending Rate: All banks

Variable	Coefficient	Std. Error	Prob.
DR	1.07	0.06	0.00***
INF	0.10	0.04	0.02**
NPL	-0.01	0.03	0.83
NSD_5	0.07	0.11	0.53
REPO	-0.07	0.09	0.40
C	3.48	1.18	0.01**
Adjusted R-squared	0.99		
F-statistic	475.86	Durbin-Watson stat	1.92
Prob(F-statistic)	0.00		

*** implies significant at 1% level while ** means significant at 5% level.

Therefore, an attempt has been made to analyze whether the bank specific or macroeconomic variables matters for the group of banks.

State Owned Commercial Banks (SCBs)

The empirical results by OLS for SCBs show that the deposit rate, inflation, non-performing loans both 3 and 5 year NSD certificate rates and repo and reverse repo policy rates are significant and appear with the expected positive signs except for the NPL.

Dependent Variable: Lending Rate: State Own Commercial Banks

Variable	Coefficient		Prob.
DR	0.52		0.00***
INF	0.15		0.00***
NPL	-0.04		0.02**
NSD_5	0.22		0.00***
REPO	0.33		0.00***
C	1.58		0.03**
Adjusted R-squared	0.96	Durbin-Watson stat	1.71
F-statistic	173.11		

*** implies significant at 1% level while ** means significant at 5% level.

Private Commercial Banks (PCBs)

The empirical results by OLS for PCBs show that only the deposit rate is significant for the private commercial banks' lending rate. This result implies that one percentage point increase in the deposits rate will increase lending rate by more than one percentage points. Like earlier the lending rate is not affected by 3 and 5 year NSD certificate rates, repo and reverse repo policy rates, inflation and non-performing loans.

Dependent Variable: Lending Rate_PCBs

Variable	Coefficient		Prob.
DR	1.29		0.00***
INF	0.01		0.93
NPL	0.09		0.55
NSD_5	-0.00		0.97
REPO	-0.15		0.44
C	3.71		0.07**
AR(1)	0.12		0.62
SIGMASQ	0.15		0.00***
Adjusted R-squared	0.93	Durbin-Watson stat	1.88
F-statistic	69.53		

*** implies significant at 1% level while ** means significant at 5% level.

Specialized Banks (SPBs)

The empirical results by OLS for SPBs show that deposit rate, significant with the expected positive signs. This means that one percentage point increase in the deposits rate will increase lending rate by 0.72 percentage points for SPBs, while inflation, repo and reverse repo rates, non-performing loans and both 3 and 5 year NSD certificate rates are appear not significant.

Dependent Variable: Lending Rate_SPBs

Variable	Coefficient		Prob.
DR	0.72		0.00***
INF	0.03		0.77
NSD_5	0.34		0.25
REPO	-0.10		0.54
NPL	-0.07		0.13
C	2.65		0.20
AR(1)	0.14		0.56
SIGMASQ	0.24		0.00
Adjusted R-squared	0.75	Durbin-Watson stat	1.99
F-statistic	15.33		
Prob(F-statistic)	0.00		

*** implies significant at 1% level while ** means significant at 5% level.

Foreign Banks (FCBs)

The empirical results by OLS for FCBs shows that the impact of deposit rate, inflation, repo and reverse repo rates on the lending rate are significant and also appear with the expected positive signs except for the repo and reverse repo rates. While both 3 and 5 year NSD certificate rates and inflation variable is not significant. It reveals from the empirical analysis that one percentage point increase in the deposits rate will increase lending rate by 1.67 percentage points while one percentage point increase in reverse repo rates will decrease the lending rate by 0.87 percentage points. This implies that among the group of banks only foreign banks respond to policy rate.

Dependent Variable: Lending Rate_FCBs

Variable	Coefficient		Prob.
DR	1.67		0.00***
INF	0.28		0.00***
NPL	0.13		0.12
REPO	-0.87		0.00***
NSD_5	-0.05		0.49
C	9.50		0.00***
Adjusted R-squared	0.98		
F-statistic	383.94	Durbin-Watson stat	1.85
Prob(F-statistic)	0.00		

***** implies significant at 1% level while ** means significant at 5% level.**

The bottom line of this analysis show that deposits rate affects the lending rate of banks strongly. Inflation, non-performing loans also have impact on the lending rate. However, the magnitude of this impact varies significantly among group of banks.

Summary of the empirical results

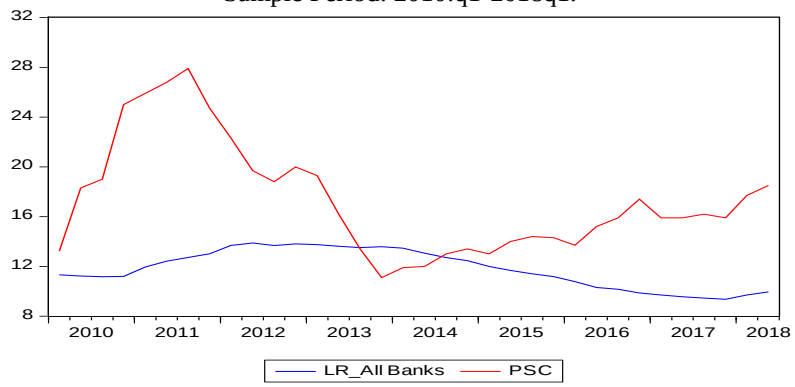
Variable	All Banks	SOCBs	PCBs	SPBs	FCBs
DR	**1.07*** **	**0.52*** **	**1.29*** **	**0.72*** **	**1.67*** **
INF	**0.10** **	**0.15*** **	**0.01**	**0.03**	**0.28*** **
NPL	**-0.01**	**-0.04** **	**0.09**	**-0.07**	**0.13**
NSD_5_	**0.07**	**0.22*** **	**0.01**	**0.34**	**-0.05**
REPO	**-0.07**	**0.33*** **	**-0.15**	**-0.1**	**-0.87*** **
C	**3.48** **	**1.58** **	**3.71***	**2.65**	**9.5*** **

Source: Authors' own calculation.

The relationship between the lending rate and the private sector credit in Bangladesh

The relationship between the private sector credit and the lending rate is further analyzed in the following diagram. The threshold level of lending rate, i.e., the level of lending rate after which the private sector credit growth of a country adversely affected draws attentions of a large pool of academicians, policymakers and researchers of both developing and developed countries due to its potentiality to jeopardize overall progress of a country. In Bangladesh, persistently higher lending rate concern whether this level of lending rate poses any threat to the private sector credit growth hence economic growth of Bangladesh. In this backdrop, an attempt has been made to estimate the threshold level of the lending rate for Bangladesh. An eye ball examination using actual quarterly data from 2010Q1 to 2018Q1 of private sector credit growth and the lending rate showed that private sector credit was much higher at the beginning of the 2010 to 2011 which started to decrease since mid-2011 and continued its declining trend until mid-2013.

Chart-14: Scatter diagram of private sector credit and the lending rate
Sample Period: 2010:q1-2018q1.



An empirical investigation using Ordinary Least Square (OLS) method also suggests very similar threshold level of lending rate (i.e., 9.91 percent) for Bangladesh. Variables used to estimate the model is as follows: PSC= Private sector credit and LR=lending rate. Using empirical results obtained from OLS and setting first differentiation=zero and solving the equation we get threshold level of lending rate of 9.91 percent. This equation also satisfies the second order condition (SOC) of maximization.

$$\delta psc/\delta lr = (17.0117/ -1.71686) = -9.90859$$

Although further investigations are needed to come up with a concrete level of lending rate which may not remain the same overtime as all the economic parameters move along. However, based on current findings we can have an idea up to what level of lending rate our private sector credit growth remain unaffected. As we have seen from eye-ball test (based on fitted data plot) and OLS estimation that the level of threshold lending rate lies within the range of 9.91-10 percent above which the private sector growth of the country may be adversely affected. As the current lending rate trend posing threat to go beyond this threshold level, policy makers may take it seriously so that the growth trend of Bangladesh economy remain unaffected.

VI. Conclusion and Recommendations

This study determines the factors that most affect the lending rate in Bangladesh. For this purpose, a set of macro and bank specific variables have been used to examine whether the lending rate move due to these variables. The Ordinary Least Square method (OLS) is used to determine the lending rate of all banks, state owned banks, private commercial banks, specialized banks and also for foreign banks. The deposit rate, inflation, non-performing loans, repo and reverse repo, both 3 year and 5 year NSD certificate rates are used. The empirical results show that the lending rate determinants vary among the different banks groups. The deposits rates appear to be the most significant variables for all banks and also for bank groups in increasing the lending rate. The both 3 year and 5 year national savings directorate (NSD) certificate rates do not affect the lending rates for all groups of banks except for the SCBs. The SCBs and FCBs lending rates adjust with inflation while SPBs and PCBs do not adjust inflation with the lending rates. Non-performing loans matters for only SCBs although appears with the wrong sign. FCBs and SCBs consider Repo and Reverse Repo policy rates while determine the lending rates. Besides, an empirical investigation using Ordinary Least Square method (OLS) also suggests that the threshold level of the lending rate lies within the range of 9.91-10.0 percent above which the private sector growth of Bangladesh may be adversely affected. Therefore, as a policy implication of this study would be to reduce the lending rate policy makers need to keep an eye on deposits rate mostly for all banks and partly on inflation, NSD certificate rate and non-performing loans and the policy rates to keep the lending rate within the 10 percent. However, it would be worthwhile to further investigate the determinants of the lending rate including

more sample periods and may use panel data analysis technique to check the robustness of the study. The recent change in the interest rate structure may also show us the new threshold level which will have further policy implications.

VII. **References**

Ayesha, A. (2011). "Interest Rate Spreads, Loan Diversification and Market Discipline in Pakistan's Commercial Banking Sector", Ph.D. thesis paper.

Beck, T.; Hesse, H. (2009), "Why are interest spreads so high in Uganda?" *Journal of Development Economics,* Volume 88, Issue 2, (March), pp. 192–204

Bhattacharya, B. B.; Bhanumurthy, N. R.; Mallick, H. (2008), "Modeling interest rate cycles in India", *Journal of Policy Modeling*, Vol. 30,n 5, pp. 899-915.

Khawaja, I.; Din, M. (2007), "Determinants of Interest Spread in Pakistan", *Pakistan Institute of Development Economics, Working Papers* (2007:22).

Mujeri, K. Mustafa and Younus, Sayera (2009), " An Analysis of Interest Rate Spread in the Banking Sector in Bangladesh," *Bangladesh Development Studies, Bangladesh Institute of Development Studies* (BIDS), vol. 32(4), pages 1-34."

Nguyen, V. C., Islam, M. A. and Ali, M. M. (2010), "Bangladeshi Lending-Deposit Rate Spread: An Econometric Analysis" *Global Economy and Finance Journal*, Volume 3. Number 2. (September) pp. 238–246.

Rubina A. (2013), "Interest Rate Spread of Commercial Banks: Empirical Evidence from Bangladesh" *ASA University Review,* Vol. 7, No. 2, (July–December)

Tigran, P (2012) "Financial Intermediation Costs in Low-Income Countries: The Role of Regulatory, Institutional, and Macroeconomic Factors." *IMF working paper* (WP/12/140).

Appendix-1

Nominal and real lending and deposit rate					
Year (June end)	Group Bank	Nominal lending	**Real lending**	Nominal deposit	**Real Deposit**
2010	State Own	8.67	**1.36**	4.98	**-2.33**
	Specialized	9.30	**1.99**	7.04	**-0.27**
	Foreign	12.38	**5.07**	3.05	**-4.26**
	Private	12.18	**4.87**	6.69	**-0.62**
2011	State Own	9.96	**1.16**	5.44	**-3.36**
	Specialized	9.45	**0.65**	7.08	**-1.72**
	Foreign	12.89	**4.09**	4.06	**-4.74**
	Private	13.41	**4.61**	8.00	**-0.80**
2012	State Own	11.77	**1.15**	6.70	**-3.92**
	Specialized	11.28	**0.66**	8.33	**-2.29**
	Foreign	14.29	**3.67**	5.20	**-5.42**
	Private	14.78	**4.16**	8.93	**-1.69**
2013	State Own	10.87	**4.09**	7.53	**0.75**
	Specialized	11.15	**4.37**	9.52	**2.74**
	Foreign	14.11	**7.33**	5.40	**-1.38**
	Private	14.62	**7.84**	8.69	**1.91**
2014	State Own	10.79	**3.44**	7.19	**-0.16**
	Specialized	11.15	**3.80**	9.47	**2.12**
	Foreign	12.44	**5.09**	4.52	**-2.83**
	Private	13.88	**6.53**	7.94	**0.59**
2015	State Own	9.99	**3.58**	6.61	**0.20**
	Specialized	9.53	**3.12**	6.62	**0.21**
	Foreign	10.96	**4.55**	3.18	**-3.23**
	Private	12.32	**5.91**	7.00	**0.59**
2016	State Own	9.00	**3.08**	5.21	**-0.71**
	Specialized	8.73	**2.81**	7.13	**1.21**
	Foreign	8.93	**3.01**	1.87	**-4.05**
	Private	10.79	**4.87**	5.64	**-0.28**
2017	State Own	8.66	**3.22**	4.47	**-0.97**
	Specialized	9.10	**3.66**	5.98	**0.54**
	Foreign	7.86	**2.42**	1.66	**-3.78**
	Private	9.79	**4.35**	4.94	**-0.50**
2018	State Own	7.80	**2.02**	4.23	**-1.55**
	Specialized	8.91	**3.13**	5.67	**-0.11**
	Foreign	9.12	**3.34**	2.05	**-3.73**
	Private	10.56	**4.78**	6.23	**0.45**
Source: Bangladesh Bank Quarterly					

Comparative position of interest rate of banks, NBFI and NSD								
Year	Banks		NBFI's		NSD Certificates			
	Deposits	Lending	Deposits	Lending	Paribar	Pensioner	3 Monthly	5 Years
June, 10	6.01	11.31	n.a	n.a	11.04	11.00	10.00	10.50
June, 11	7.27	11.42	n.a	n.a	11.04	11.00	10.00	10.50
June, 12	8.15	13.75	n.a	n.a	13.45	13.19	12.59	13.19
June, 13	8.54	13.67	14.21	17.44	13.45	13.19	12.59	13.19
June, 14	7.79	13.10	12.52	16.90	13.45	13.19	12.59	13.19
June, 15	6.80	11.67	10.61	15.12	11.52	11.76	11.04	11.28
June, 16	5.54	10.39	8.95	13.07	11.52	11.76	11.04	11.28
June, 17	4.84	9.56	8.37	11.69	11.52	11.76	11.04	11.28
June, 18	5.50	9.95	10.14	12.67	11.52	11.76	11.04	11.28
Source: Statistics Department, Bangladesh Bank.								

Wighted Average Rate of Interest on Deposits (30-06-2018)										
Banks	All Deposits	Savings Deposits	Special Notice Deposits	Fixed Deposits	For<6 months	6 Months to <1 year	1 year to <2 years	2 years to<3 years	3 Years and Above	Other Deposits
All Banks	5.47	3.36	3.99	7.86	7.60	8.01	7.11	7.62	10.17	3.55
State Owned Banks	5.75	3.37	3.50	6.02	5.99	6.27	5.59	6.49	11.82	5.13
Specialized Banks	4.36	3.55	3.75	7.27	4.87	5.00	5.20	5.88	9.88	2.70
Private Banks	5.96	3.22	4.18	8.46	8.26	8.42	8.06	7.91	10.02	3.71
Islamic Banks	6.50	3.81	3.48	3.48	8.24	8.33	8.21	8.12	9.02	5.00
Source: Scheduled Bank Statistics, Bangladesh Bank.										

Weighted Average Rate of Interest on Advances (30-06-2018)										
Banks	All Advances	Agriculture, Forestry & Fishing	Industry		Construction	Transport	Trade & Commerce	Other Institutional Loan	Consumer Finance	Miscellaneous
			Term Loan	Working Capital Financing						
All Banks	9.90	7.28	9.78	10.51	9.63	8.37	9.97	10.29	10.49	7.46
State Owned Banks	7.26	7.22	7.39	6.86	5.70	2.74	7.12	8.40	9.37	7.63
Specialized Banks	6.17	5.85	9.84	9.23	4.87	10.88	8.11	0.00	6.74	3.70
Private Banks	10.65	9.64	10.67	10.91	10.65	10.31	10.49	10.55	11.02	7.85
Islamic Banks	10.36	10.21	10.48	10.11	9.90	10.30	10.80	9.15	8.63	5.69
Source: Scheduled Bank Statistics, Bangladesh Bank.										